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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/086,397  | 03/01/2002  | Gary K. Starkweather | 167407.1            | 1318             |
| 21034   | 7590        | 12/15/2003           | EXAMINER            |                  |
| IPSOLOL LLP<br>805 SW BROADWAY, #2740<br>PORTLAND, OR 97205 |             |                      | LIU, MING HUN       |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2675                | 2                |

DATE MAILED: 12/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |
|------------------------------|------------------------|---------------------|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|                              | 10/086,397             | STARKWEATHER ET AL. |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |
|                              | Ming-Hun Liu           | 2675                |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-27 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
  - a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ .                                   |

**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7, 10, 11, 13-18, 21- 24 and 27 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of US Patent 6,650,460 to Kurematsu and US Patent 5,640,479 to Hegg et al.

Kurematsu and Hegg both disclose a projection display systems that resemble the one being claimed. Kurematsu's reflective system coincides with the claimed invention with the exception of a few optical elements, namely the reflector and the aperture plate. On the other hand, Hegg's optical system is arranged nearly identical to the one being claimed.

There are several ways of arranging optical elements for the system to work. Hegg offers an alternate embodiment with the same underlying functional ideas.

One skilled in the art can easily replace optical elements such as beamsplitting reflector a different aperture plate in optical systems.

It would have been obvious to implement Hegg's system arrangement with Kurematsu because Hegg presents alternative embodiment is common to the art. Kurematsu's invention is the primary reference since the crux of the invention lies in the formation of the mirror actuation. The references will be combined in a way where

Kurematsu invention will be modified by implementing Hegg's optical system arrangement and the result anticipates the claimed invention.

In reference to claims 1 and 16, Hegg shows in figure 5 a micro electrical mechanical display system that includes an illuminating light source (item 60), a collimating lens (68), a microlens array (76 and column 5, lines 64-65), and an aperture plate (78 and column 6, lines 16-20) that allows the illuminated light onto the mirrors. The mirrors are aligned with the apertures, the tilting of the mirrors dictate whether the light is reflected back into the aperture or blocked (figures 6 and 7; column 4, lines 24-27).

In reference to claim 2, Hegg clearly shown in figure 5, a reflector (72) directed the collimated light onto the mirrors.

In reference to claim 3, it can also be seen that the light reflected from the mirror is transmitted through reflector (72) and onto the display screen (86).

In reference to claim 4, Hegg teaches that reflector (72) is a beamsplitter (column 5, lines 62-63).

In reference to claim 5, it can be seen form Kurematsu's figures 3 and 4, the reflector array is formed on a planar substrate (item 31) and has an actuating arm (45) that support the reflectors (35) where the substrate, the arm and the reflectors are coplanar.

In reference to claims 6, 17 and 23, as described on column 2, lines 5-7 of Kurematsu, the actuating arms are activated when the deformable layer 45 is charged between the two electrodes (43 and 47).

In reference to claim 7, 18 and 24, Kurematsu teaches that only with an applied voltage does the arm tilt to the desired angle (column 2, lines 14-19).

In reference to claim 10, 21 and 27, as shown in Kurematsu figures 5 and 6 and described in column 5, line 65-column 6, line 14, the tilt angles are compute used to obtained the desired brightness and grayscale levels.

In reference to claims 11, as shown in figure 2, one of the embodiments of Kurematsu includes using only one light source.

In reference to claim 13, Kurematsu describes a display system that polychromatic, but does not go into detail about reducing the display to monochromatic.

One skilled in the art could have easily removed the other two color components to create a monochromatic display.

One would have been motivated to do so, if the product required only monochromatic display abilities for various reasons such as reducing hardware and cost.

In reference to claims 14 and 15, Kurematsu teaches on column 3, lines 40-47, that the display is polychromatic and the colors are created when the different colors are mixed at different time periods.

Claim 22 is rejected on grounds presented in the rejection of claims 1 and 5.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Kurematsu in view of Hegg and further in view of US patent 6,654,156 to Crossland et al.

In reference to claim 12, Kurematsu and Hegg describes display systems that are similar to the one being claimed, however neither explicitly states the type of display screen that the system uses.

As one skilled in the art understands, most of display screen manufactured today use transmissive display screens.

It would have been obvious to one skilled in the art to use transmissive display screen because of their extreme conventionality.

4. Claims 8, 9, 19, 20, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurematsu in view Hegg and further in view of US Patent 6,353,492 to McClelland et al.

In reference to claims 8, 9, 19, 20, 25 and 26, Kurematsu's invention discloses the use of actuated mirror array (AMA) but not specifically MEMS technology actuation. As McClelland explains in that most micro mirrors are driven using electrostatic actuation where the different stress levels result in physical manipulations when an voltage is applied (column 2, lines 13-17). Furthermore with respect to claims 8 and 9, the claims simply reiterate the inherent theoretical functioning of MEMS technology and does not further limit the invention.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 6,329,967 to Little et al.: Mirror actuated surfaces, bistable states.

US Patent 5,729,386 to Hwang: Reflective display using AMA.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ming-Hun Liu whose telephone number is 703-305-8488. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on 703-305-9720. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Ming-Hun Liu



STEVEN SARAS  
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